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## "Experimentation and modeling in Cosmochemistry"

Nancy July 11-13, 2009

Salon d'Honneur des Universités

Place Carnot

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### Saturday, July 11

08.30: Arrival

09.00: G. Libourel: Welcome

#### Dust and gas evolution in nebular processes

09.20 F. Ciesla            Introductory talk: The dynamic of the solar nebula

09.40 D. Apai             The evolution of protoplanetary dust: the astrophysical perspective

10.15 I. Kamp             Gas evolution in protoplanetary disks

10.50 Discussion

*11.10 Coffee*

11.25 Flash talks

11.25 M. Gounelle            The origin of  $^{60}\text{Fe}$  in the early solar system

11.30 P. Reinhardt            Isotopic indistinguishability, scattering processes and the non mass dependent fractionation observed in ozone

11.35 M. Godard             Photoluminescence of an interstellar dust laboratory analog

11.40 A. Tsuchiyama         An experimental study of circumstellar silicate dust crystallization.

11.45 M. Roskosz            The inhibition of pyroxene formation during low temperature annealing of cosmic silicates

11.50 Discussion

12.00 C. Le Guillou         Graphitization kinetics of nanodiamond: implication for conditions of nebular processes of presolar grains

12.05 E. Luetjohann         Gas-grain reactions of presolar carbon and silicon carbide dust in protoplanetary disc

12.10 T. Fukui              Collisional fragmentation of dust as a necessary step in early solar system evolution

12.15 H. P. Gail             Evaporation, condensation, annealing and mixing dust during disk evolution

12.20 Discussion

12.30 J. Teiser             Planetesimal growth through collisions? Yes we can!

*13.00 Lunch*

#### Condensation processes in protoplanetary disk

14.30 H. Nagahara         Introductory talk: Link between experiments and modeling in condensation and fractionation in the protoplanetary disk

14.50 L. Grossman         Knowledge gaps in applying condensation calculations to chondrites

15.30 S. Tachibana         Experimental studies on condensation kinetics of magnesium silicates and metallic iron

16.10 Discussion

16:30 Coffee

16.40 Flash talks

- 16.40 M. Klevenz Evaporation and Condensation of Silicates  
16.45 M. Klevenz Condensation in the Fe-Mg-FeO-MgO system  
16.50 S. Wetzel Vapor pressure studies on silicates.  
16.55 G. Montes-Hernandez Solid-gas carbonation of calcium hydroxide.  
Implications on the carbonate formation in Martian aerosols.  
17.00 M. Gerasimov Experimental simulation of formation of lunar impact-induced condensates  
17.05 Discussion

17.20 H. Palme Direct evidence for condensation of mineral grains in chondritic meteorites  
17.50 Discussion

18.00 End of the session

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### Sunday, July 12

#### Thermal (re)processing in the protosolar disk

- 08.30 R. Hewins Introductory talk: Refractory inclusions and chondrules  
08.50 J. Beckett Experimental techniques applicable to processing and reprocessing primitive solar nebular materials  
09.30 A. Davis. Experimental constraints on the role of evaporation in the origin of calcium-aluminum-rich inclusions  
10.10 Discussion

10.30 Coffee

10.50 Flash talks

- 10.50 R. Mendybaev Multiple heating events and crystallization of melilite  
10.55 S. Simon The need for experiments in the interpretation of measurements from natural samples: some examples  
11.00 B. Oehm New laboratory experiments on thermal annealing of forsterite in protoplanetary disk  
11.05 F. Faure Experimental constraints on the formation of dusty olivines  
11.10 Discussion  
11.20 R. Mathieu Experimental quantification of Na solubility in silicate melts. Application to chondrule formation.  
11.25 D. Hezel The size of chondrule precursor grains in closed system environments  
11.30 J. Das Can noble gas composition of chondrules be used to estimate degree of metal and silicate separation?  
11.35 SVS. Murty Artificial synthesis of chondrules under microgravity  
11.40: Discussion

11.50 J. Ganguly Thermal history of meteorites: records in mineral compositions and mineral ages: kinetics theories, experiments and applications

12.40 Discussion

13.00 Lunch

## Ices and organics

- 14.30 F. Robert Introductory talk: Ices and organics in the early solar system  
14.50 E. Quirico Volatiles in Early solar system: Astronomical observations and experimental simulations  
15.30 J. A. Nuth A Self-Perpetuating Catalyst for the Production of Complex Organic Molecules in Protostellar Nebulae

16.10 Discussion

16:30 *Coffee*

- 16.45 Flash talks  
16.45 J.Y. Bonnet: Thermal degradation experiments of cometary N-rich organics analogs  
16.50 A. Ratajczak Spontaneous D-H exchange between water ice and complex organics molecules (COMS) in protostellar environments  
16.55 D. Rost C60-TOF-SIMS: A tool for high resolution in situ mapping of organic compounds  
17.00 Discussion  
17.30 End of the session

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19h30 Party at the CRPG

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## Monday, July 13

### Parent body processes

- 08.30 K. Righter Introductory talk: primary differentiation  
08.50 N. Chabot Experiments in metallic systems: understanding the differentiation and evolution of planetary bodies  
09.30 B. Wood Accretion and core formation: constraints from metal-silicate partitioning experiments  
10.10 Discussion  
10.30 *Coffee*  
10.50 Flash talks  
10.50 J. Guinard Experimental quantification of grain growth in olivine-metal mixtures: application to small parent bodies during early accretion  
10.55 V. Malavergne Experimental study on the mechanisms of CaS-MgS-FeS monosulfides formation: implications for enstatite meteorites and the S budget in small planetary bodies  
11.00 J. Wade Enstatite chondrites and related Earth models  
11.05 A. Martin Redox interactions between iron and carbon in planetary mantles: implications for degassing and melting processes  
11.10 Discussion  
11.20 J. Siebert Earth's core formation: new constraints from siderophile elements partitioning  
11.25 A. Corgne No iron isotope fractionation during high-pressure molten metal-molten silicate equilibration: implications for planetary accretion  
11.35 K. Righter Constraining the depth of a martian magma ocean...

- 11.40 K. Righter Calculation of oxygen fugacity in high pressure metal-silicate experiments and comparisons to standard approaches
- 11.45 Z. Xie Shock-transformed olivine to ringwoodite in the antarctic chondrites: mechanisms of transformation and Fe-Mg diffusion
- 11.50 Discussion

- 12.00 P. Michel From giant impacts to the catastrophic disruptions of asteroids: Influence of the internal structure on the outcome and on the resulting material state
- 12.40 Discussion

*13.00 Lunch and end of the workshop*